Instructional Materials Evaluation Criteria – Pre-Algebra

Title _____ **ISBN#** _____

Established Track Record? YES ☐ NO ☐
If yes, please list research source(s):

Meets National Mathematics Standards? YES ☐ NO ☐

Standard 1: Students will acquire number sense and perform operations with rational numbers, including negative rational numbers.

Objectives	Indicators	Covered? Yes	Covered? No	Explanation of Coverage	Percentage of Coverage
Objective 1.1: Understand, compute fluently and make reasonable estimates with rational numbers.	a. Understand and compute fluently, using all four operations, with integers.				
	b. Understand and compute fluently, using all four operations, with rational numbers, including negative fractions and decimals.				
	c. Check the reasonableness of results using estimation.				
Objective 1.2: Identify relationships among rational numbers, including negative rational numbers, and operations involving these numbers.	a. Compare and order rational numbers in various forms, including scientific notation (positive and negative exponents), with and without a number line				
	b. Identify the effects of arithmetic operations among various forms of rational numbers.				
	c. Recognize and use the identity properties of addition and multiplication, the multiplicative property of zero, the commutative and associative properties of addition and multiplication, and the distributive property of multiplication over addition.				

	d. Recognize and use the inverse relationships of addition and subtraction, multiplication and division, and perfect squares and their roots.				
Objective 1.3: Solve problems involving rational numbers using addition, subtraction, multiplication, and division.	a. Recognize the absolute value of a rational number as its distance from zero.				
	b. Evaluate numeric expressions, including those with integer exponents and absolute values using the order of operations.				
	c. Solve problems involving rational numbers, percents and proportions.				

Standard 2: Students will use the language of algebra to analyze and represent relationships, including real-life relationships.

Objectives	Indicators	Covered? Yes	Covered? No	Explanation of Coverage	Percentage of Coverage
Objective 2.1: Generalize and express patterns using algebraic expressions.	a. Use numbers and variables to represent a variety of relations using tables, graphs, manipulatives, algebraic symbols and mathematical rules.				
	b. Describe simple patterns using a mathematical rule or algebraic expression.				
	c. Create and extend simple numeric and visual patterns.				
Objective 2.2: Evaluate, simplify and solve algebraic expressions and equations.	a. Evaluate algebraic expressions, including those with whole number exponents, when given values for the variable(s).				

	b. Simplify algebraic expressions using the properties of algebra.				
	c. Solve simple single-variable linear equations and inequalities, including those that must be simplified on one side or those with variables on both sides of an equation.				
Objective 2.3: Represent relationships using graphs, tables and other models.	a. Graph ordered pairs of rational numbers on a rectangular coordinate system.				
	b. Identify approximate rational coordinates when given the graph of a point on a rectangular coordinate system.				
	c. Model real-world problems using various representations, such as graphs, tables, equations, manipulatives, and pictures and identify extraneous information.				
Objective 2.4: Develop an understanding of proportionality	a. Compare ratios to determine if they are equivalent.				
	b. Compare ratios using the unit rate.				
	c. Recognize percents as a ratio based on 100.				
	d. Recognize decimals as ratios based on powers of ten.				
	e. Graph proportional relationships and identify the unit rate as the slope of the related line.				
	f. Recognize y=kx as the proportional relationship y/x=k.				
Objective 2.5: Use ratio and	a. Use variables to set up and				

proportionality to solve a wide variety of problems.	solve problems involving proportional reasoning.				
	b. Solve percent problems including problems involving discounts, interest, taxes, tips, and percent increase or decrease.				
	c. Solve ratio and rate problems using simple reasoning about multiplication and division.				
	d. Use scale factors to solve problems.				

Standard 3: Students will recognize, describe, and identify geometric shapes, and solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.					
Objectives	**Indicators**	**Covered? Yes**	**Covered ? No**	**Explanation of Coverage**	**Percentage of Coverage**
Objective 3.1: Analyze characteristics and properties of two- and three-dimensional shapes.	a. Identify similar figures based on proportionality.				
	b. Find missing lengths of similar plane figures, including inaccessible distances, using proportions.				
	c. Classify two- and three-dimensional objects according to their defining characteristics.				
	d. Identify relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.				
	e. Create and interpret scale drawings.				

Standard 4: Students will understand and apply measurement tools, formulas, and techniques.					
Objectives	**Indicators**	**Covered? Yes**	**Covered ? No**	**Explanation of Coverage**	**Percentage of Coverage**

Objective 4.1: Apply the properties of proportionality to different units of measure.	a. Convert from one unit of measure to an equivalent unit of measure in the same system using a given conversion factor.				
	b. Use properties of similarity to create and interpret scale drawings and approximate distance on maps.				
	c. Solve problems involving scale factors using ratios and proportions.				
	d. Solve problems involving rates and measures.				
Objective 4.2: Develop and understand formulas for surface areas and volumes of three dimensional shapes.	a. Develop formulas for and calculate surface area and volume of right prisms and cylinders using appropriate units.				
	b. Understand that if a scale factor describes how corresponding lengths in two similar objects are related, then the square of the scale factor describes how corresponding areas are related, and the cube of the scale factor describes how corresponding volumes are related.				
	c. Select appropriate two and three dimensional shapes to model real-world situations and solve a variety of problems involving surface areas and volumes of cylinders and prisms.				

Standard 5: Students will draw conclusions using concepts of probability after collecting, organizing, and analyzing a data set.					
Objectives	**Indicators**	**Covered? Yes**	**Covered ? No**	**Explanation of Coverage**	**Percentage of Coverage**
Objective 5.1: Formulate and answer questions by	a. Collect, organize, display, and interpret data using graphical				

collecting, organizing, and analyzing data.	representations, including box plots and histograms.				
	b. Make conjectures from a graphical representation.				
	c. Determine the appropriate measure of central tendency for a given set of data.				
	d. Describe how an individual data point may affect the measures of central tendency.				
	e. Make predictions and evaluate inferences of data samples.				
	f. Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and leaf plots, box plots and scatterplots.				
Objective 5.2: Compare experimental and theoretical probability and use probability to make appropriate predictions.	a. Understand that when all outcomes of an experiment are equally likely, the theoretical probability of an event is the fraction of outcomes in which the event occurs.				
	b. Recognize that results of an experiment more closely approximate the actual or theoretical probability of an event as the number of trials increases.				
	c. Derive the probability and odds of an event mathematically using models and the Fundamental Counting Principle.				
	d. Use theoretical probability and proportions to make approximate predictions.				
	e. Recognize that the sum of the probability of an event and the probability of its complement is equal to one				

Curriculum Coverage	**3**	**2**	**1**	**0**	**N/A**
Meets Core Standards and Objectives	80% of the state core objectives are covered. Objectives in instructional materials are clearly stated with measurable outcomes.	70% of the state core objectives are covered. Objectives in instructional materials are clearly stated with measurable outcomes.	50% of the state core objectives are covered.	Less than half of the state core objectives are covered.	
Content	Accurate information reflecting current mathematical knowledge. No content bias.	Some inaccuracies found, however information reflects current mathematical knowledge. No content bias.	Many inaccuracies were found on major mathematical concepts or content bias created problems with mathematical concepts.	Major inaccuracies found in mathematical content or concepts.	
Covers Process Skills	Materials support and encourage students to use mathematical process skills (i.e., problem solving, communication, reasoning and proof, connections, representation).	Materials provide a range of activities with set outcomes. Process skills are mentioned but not incorporated into instructional process.	Materials provide a set of explicit step-by-step instructions. Limited amount of process skills mentioned.	No hands-on activities. No process skills mentioned.	
Age Appropriate	A wide range of activities to accommodate various developmental levels at a reasonable pace and depth of coverage. Includes age appropriate cross-curricular references (e.g., literature, software, etc.) Content organized so prerequisite skills and knowledge are developed before more complex skills.	Some activities are adaptable to the appropriate age level. Some cross-curricular activities are given. Some attention given to prerequisite skills and knowledge.	Limited developmentally appropriate activities. Prerequisite skills and prior knowledge are not sufficiently developed before more complex concepts are introduced.	Age appropriate issues are not addressed. Several activities are not based on appropriate levels.	
Pedagogically Sound	Facilitates a wide range of teacher and student activities that reflect various learning styles and individual needs of students. Includes a wide variety of pedagogical strategies for flexible grouping and instruction.	Encourages and assists teachers in addressing learning styles and individual needs of students. Includes various pedagogical strategies for flexible grouping and instruction.	Addresses differences in learning and teaching to a limited degree. Includes some pedagogical strategies for flexible grouping and instruction.	Hinders effective pedagogy.	

Physical Qualities	**3**	**2**	**1**	**0**	**N/A**
Durability	Materials are securely bound and reinforced.	Materials are hardbound adequately.	Materials have secure binding.	Materials have inferior binding.	
Print Size and legibility for intended grade level	Appropriate use of font size and format for intended grade level.	Font size adequate for intended grade level.	Font size and format too small or too large for age group.	Font size inconsistent.	
	Key words or phrases bold faced and/or italicized.	Some key words or phrases boldfaced and/or italicized.	Highlighting was used too much, emphasized too much information.	No key words or phrases boldfaced or italicized.	
Pictures, tables, and graphics	Appropriate and varied pictures, tables, and graphs. Graphs and tables are correctly labeled (e.g., titles, keys, labels).	Limited pictures, tables, and graphs. Some tables and graphs are not labeled correctly.	Very limited pictures, tables, and graphs.	Inappropriate pictures, tables, and graphs.	
Includes table of content, glossaries, and index	Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students. Clearly represents concepts within the text.	Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students, are adequate but not clearly defined concepts within the text.	Simple tables of contents, indices, glossaries, content summaries, and assessment guides are included.	Is missing one or more of the following: simple table of contents, glossaries, content summaries, assessment guides, or indices.	
Ancillary Materials	**3**	**2**	**1**	**0**	**N/A**
Teacher Materials	Lesson plans are easy to understand and implement. Are clearly written and presented with accurate concepts.	Most lesson plans are easy to understand and implement. Are clearly written and presented with accurate concepts.	Lesson plans are difficult to understand.	No lesson plans.	
	Mathematical terms and academic vocabulary are appropriately used.	Generally mathematical terms and academic vocabulary are appropriately used.	Some mathematical terms and academic vocabulary are appropriately used.	There is a lack of mathematical terms and academic vocabulary.	
	Incorporates integration suggestions to other curriculum areas.	Most integration supports other curricular areas.	Some integration support for other curricular areas.	No integration support available.	
	Investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Most investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Limited investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Investigations and problem solving activities are not related to content area or no investigation activities.	

Ancillary Materials cont.	**3**	**2**	**1**	**0**	**N/A**
Student Materials	Activities engage students in purposeful mathematics.	Most activities engage students in purposeful mathematics.	Some activities engage students in purposeful mathematics.	Activities do not develop the concept studied.	
	Activities incorporate use of process skills (i.e., problem solving, communication, reasoning and proof, connections, representation) for deep understanding of mathematical principles.	Activities encourage the use of process skills for deep understanding of mathematical principles.	Activities mention the use of process skills for deep understanding of mathematical principals.	Activities do not encourage process skills for deep understanding of mathematics.	
	Includes ideas to extend concepts in real world applications.	Some ideas are included to extend concepts in real world applications.	Limited real world applications.	No real world applications suggested.	
Parent Materials	Homework assignments and activities support classroom learning and are written so that parents/guardians can help their children.	Suggested strategies and activities to assist parents/guardians.	Limited activities available for parent/guardian use.	No parent/guardians activities included.	
	ESL strategies and activities that support classroom learning are provided in materials sent home to parents.	Some ESL strategies and activities are provided in materials sent home to parents.	A few ESL strategies and activities that may be sent home to parents are provided.	No ESL strategies and activities are provided.	
Manipulatives	Manipulatives are provided and are appropriate.	Manipulatives are provided.	Manipulatives are not provided.	Manipulatives are not part of the program.	
	Manipulatives can be replaced economically and locally.	Manipulatives can be replaced locally or by mail order.	Needed manipulatives can be obtained locally or special ordered.		
Technology (teachers)	**3**	**2**	**1**	**0**	**N/A**
Ease of Use	Menus are easy to read and follow.	Menus are generally easy to read and follow.	Menus are easy to read. Might have to read manual to understand operation of technology. (e.g., laser remote, software.)	Menus are not very descriptive. Hard to follow.	
	User-friendly installation requires a minimal level of computer expertise.	Installation requires little computer expertise.	Installation requires some knowledge or expertise.	Installation requires expertise.	
	Manual and directions are understandable.	Manuals and directions are simple.	Manuals are included.	No manuals or written instructional materials are provided.	

Technology (teachers) cont.	**3**	**2**	**1**	**0**	**N/A**
Audio/Visual attributes	High quality audio and visuals are correct and contribute to overall effectiveness of program.	Audio and visuals are of good quality. Complements program effectiveness.	Audio and visuals are acceptable. Aligned with program content.	Audio and visual defects are apparent. Distracts from program content.	
	Information is current and up-to-date.	Information is current.	Information is mostly current.	Information is out-of-date.	
Enhances learning experience	Enhances learning experience. Adds depth and diversity.	Offers some additional depth and diversity to learning experience.	Mild impact to overall learning experience.	Does not impact learning experience.	
Technology (students)	**3**	**2**	**1**	**0**	**N/A**
Calculator	Appropriate activities and materials are provided to explore and prove conjectures.	Activities help students learn use to use calculator to explore concepts	Activities to learn to use calculators	No use of calculators or calculators used to check work only.	
Computer	Software allows students to explore and prove mathematical conjectures	Software allows students to explore math conjectures	Software demonstrates processes for mathematical applications	Drill and practice only	
Universal Access	**3**	**2**	**1**	**0**	**N/A**
Content accurately reflects diverse population	Provides ways to adapt curriculum for all students (e.g., special needs, learning difficulties, English language learners, advanced learners.)	Provides some ways to adapt curriculum to meet assessed special needs.	Provides limited strategies to assist special needs students.	Inappropriate strategies to assist special needs students.	
	Accurate portrayal of cultural, racial, and religious diversity in society.	Mostly accurate portrayal of cultural, racial, and religious diversity in society.	Does not address diversity in society.	Inaccurate portrayal of diverse populations and society.	
Assessment	**3**	**2**	**1**	**0**	**N/A**
Provides a variety of assessment options	Multiple measurements of individual student progress at regular intervals ensuring success of all students.	Assessment requires students to apply some concepts.	Assessment requires students to apply few concepts.	Provides only paper and pencil assessment.	

Assessment cont.	**3**	**2**	**1**	**0**	**N/A**
Assessment tools	Scoring tools and rubrics in assessment package.	Some scoring tools and rubrics provided.	Very few assessment tools are provided.	Answer keys to paper and pencil assessments.	
Assessment alignment to objectives	Assessment is provided to assess 80% of stated objectives with a variety of assessment strategies and items.	Assessment is provided to assess 70% of stated objectives.	Assessment is provided to assess 50% of stated objectives.	Assessment is provided to assess less than 50% of stated objectives.	
Assessment for understanding	Assessment requires the application of ideas and concepts.	Assessment requires the application of some ideas and concepts.	Assessment requires the application of few ideas and concepts.	No application of ideas and concepts.	